

REMARKS

Claims 1-46 are pending in the application. Applicants respectfully request reconsideration of the rejections set forth in the Office Action dated August 12, 2005 in light of the following remarks.

Claim Objections

Claim 25 was objected to as being in improper dependent claim form. The Office Action states that "claim 24 does not include the steps as cited in claim 23". Applicants respectfully disagree; see CFR 1.75(c): "Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim". Since dependent claim 24 claims reference to claim 23, claim 24 then includes (a) and (b) from independent claim 23, and dependent claim 25 properly limits subject matter in dependent claim 24. Withdrawal of the objection is thus respectfully requested.

Rejections Under 35 U.S.C. §102/103

Claims 1-2, 5-10, 12-16, 19-20, 23-26, 28-36 and 39-46 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,912,706 to Kikuchi et al. ('Kikuchi').

Claims 21-22 and 37-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over Kikuchi in view of U.S. Patent No. 5,818,536 to Morris et al. ('Morris').

Applicants respectfully traverse both rejections.

Kikuchi is concerned with motion vector sensitivity during transmission and the need to prevent failures in the transmission of motion vectors from spreading (see Background, col 4 lines 51-62). He notes that propagation for a single flawed motion vector can ruin an entire decoded picture. To overcome this problem, he invents a system to reduce transmission failures in delivery of motion vectors by coding the motion vectors in a codebook.

The claimed invention uses a residual error codebook comprising a set of residual error vectors that each include an array of predetermined motion compensation errors. The motion compensation errors refer to errors between decoded video data and synthesized video data produced using motion compensation with motion vectors.

Applicants continue to assert that Kikuchi fails to anticipate the claimed invention and teach all the limitations of the independent claims.

The Office Action dated November 16, 2005 has misinterpreted the reference. The Response to Remarks on page 3 asserts: "In Kikuchi, the residual differences between the video signal and the prediction signal are vector values stored in the code book 204 with associated code book index, which is the residual vector index". This is incorrect. As stated in col. 18 lines 6-14, the **prediction circuit 201 generates a prediction signal** (lines 10-13) that is "obtained by performing the motion compensation prediction of the local decoded picture signal 125 using the motion vector corresponding to the code vector 213". Thus, Kikuchi performs motion compensation with a motion vector (that is indexed in his codebook) to get the prediction signal. Kikuchi continues (lines 14-16): "The error calculator 202 computes the magnitude of the difference (error) between the video signal 121 and the prediction signal 122 and generates an error level signal 211". Thus, residual differences (errors) are calculated, and are not vector values stored in the code book 204 as asserted in the Response to Remarks.

Since the Remarks on page 3 are not supported by the reference, then comments made in the previous Response filed by the Applicants on October 7 2005 remain uncontested, and the claims are allowable for reasons cited in the previous Response.

For example, Kikuchi does not teach or suggest "a residual error codebook comprising a set of residual error vectors and a residual error vector index associated with each residual error vector, each residual error vector in the set of residual error vectors comprising an array of predetermined motion compensation errors" as recited in claim 1. As mentioned previously, Kikuchi only discusses a codebook for motion vectors, not motion compensation errors as recited, which are found after motion compensation using motion vectors. His motion vectors are used as translations between video during motion compensation, the claimed motion compensation errors represent errors (after motion compensation) between the motion compensation output and decoded video. Motion vectors and motion compensation errors are not interchangeable to one of skill in the art, and the claimed limitations ("residual error codebook", a "residual error vector index", or a "residual error vector") are also not interchangeable with the motion vector codebook components of Kikuchi.

Other portions of Kikuchi further demonstrate how Kikuchi fails to teach the claimed invention. These include:

the motion vectors are referenced by the codebook - see col. 7 lines 40-54;

Kikuchi's error signal is DCT transformed, quantized and VLC encoded for transmission (he does not use a codebook for the residual errors) - see col. 10 lines 27-45 and 17 lines 27-61;

Thus, in all embodiments, Kikuchi uses DCT, quantization and variable length coding to code residual errors (see col. 17 lines 27-42). He thus does not remotely suggest a "residual error codebook", a "residual error vector index", or a "residual error vector" as recited in the claims.

Kikuchi only discusses a codebook for motion vectors. He does not teach a "residual error codebook", a "residual error vector index", or a "residual error vector" as recited. Claim 1 for example recites "a residual error codebook comprising a set of residual error vectors and a residual error vector index associated with each residual error vector, each residual error vector in the set of residual error vectors comprising an array of predetermined motion compensation errors".

Therefore, several limitations in each independent claim are not taught or suggested by Kikuchi. For at least these reasons, Kikuchi does not teach or suggest all the limitations in independent claims 1, 7, 14, 23, 34 and 40 and the independent claims are allowable.

Dependent claims 21-2, 5-10, 12-16, 19-20, 23-26, 28-36 and 39-46 each depend directly from independent claims 1, 7, 14, 23, 34 and 40, respectively, and are therefore respectfully submitted to be patentable over Kikuchi and/or Morris for at least the reasons set forth above with respect to the independent claims. Further, the dependent claims recite additional elements which when taken in the context of the claimed invention further patentably distinguish the art of record.

Claims 1, 7, 14, 34, 40 and 44-46 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,826,225 to Hartung et al. ("Hartung") in view of Kikuchi. Applicants traverse this rejection also.

Hartung converts input **decoded** video into: a) a combination of a codebook index and an error differential, or b) a compressed version of the original block of data, depending on which of a) or b) takes lets bits.

The Office Action also misinterprets Hartung. Hartung's codebook includes vectors that best approximate decoded video (see col. 1 lines 59-65 and col. 2 line 63 to col. 3 line 1). These are not errors – to the contrary, he assumes that they are best fit approximations. He then computes a separate error based on the difference between the input decoded video and his codebook vector approximation (see col. 3 lines 1-3). He then separately sends the approximation (via codebook index) and the error (via compression).

Thus, the codebook of Hartung estimates raw video, and does not teach “a residual error codebook comprising a set of residual error vectors and a residual error vector index associated with each residual error vector, each residual error vector in the set of residual error vectors comprising an array of predetermined motion compensation errors” as recited.

The portions of Hartung used by the Office Action do not teach or suggest the present invention. More specifically, col. 4 lines 7-45 describe how Hartung selects a vector that best approximates decoded video (lines 10-13), computes an error based on the difference between the input decoded video and his codebook vector approximation of the decoded video (lines 15-18), and compresses the residual error (lines 19-24). Thus, Hartung's residual error is compressed, and not indexed in a residual error codebook as recited in the claims. Therefore, Hartung fails to teach a residual error codebook as recited. Also, Hartung does not teach or suggest a residual error codebook where “each residual error vector in the set of residual error vectors comprising an array of predetermined motion compensation errors” as recited in claim 1. These are errors resulting from compression approximations; his codebook purely approximates decoded video.

As mentioned above, Kikuchi also fails to teach these limitations. The combination of Hartung and Kikuchi thus also fails to teach all the limitations in the claims or otherwise render the claimed invention unpatentable.

Therefore, several limitations in each independent claim are not taught or suggested by Hartung and Kikuchi – alone or in combination. For at least these reasons, Hartung and Kikuchi do not teach or suggest all the limitations in independent claims 1, 7, 14, 23, 34 and 40 and the independent claims are allowable.

Claims 2-4, 10-11, 16-18 and 26-27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hartung in view of Kikuchi and in further view of U.S. Patent Application No. 2005/0207500 to Bober ('Bober').

Claims 5 and 36 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hartung in view of Kikuchi and in further view of Bober.

Claims 21-22 and 37-38 were rejected under 35 U.S.C. 103(a) as being unpatentable over Hartung in view of Kikuchi and in further view of Morris.

Applicants traverse these rejections as well. Dependent claims 2-4, 5, 10-11, 16-18, 21-22, 26-27, 36 and 37-38 each depend directly from independent claims 1, 7, 14, 23, 34 and 40, respectively, and are therefore respectfully submitted to be patentable over Kikuchi, Hartung, Morris and/or Bober for at least the reasons set forth above with respect to the independent claims. Further, the dependent claims recite additional elements which when taken in the context of the claimed invention further patentably distinguish the art of record.

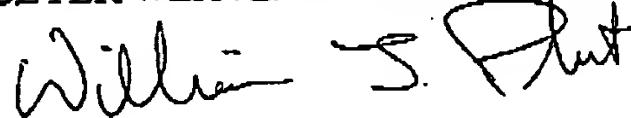
Withdrawal of the rejections under 35 USC §103(a) is therefore respectfully requested.

Applicants believe that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Response is to be charged to Deposit Account No. 50-0388 (Order No. CISCP193).

Respectfully submitted,

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